

# University of Kota, Kota

## Skill Enhancement Course for Sixth Semester of the Bachelor of Science (B.Sc.)

### Paper 6.7: SEC: Industrial Chemistry

<b>Contact Hours/Week</b>	: 02 Hours/Week	<b>Total Credits</b>	: 2 Credits
<b>Duration of Examination</b>	: 1.5 Hours/Paper	<b>Maximum Marks</b>	: 50 Marks
<b>Nature of Examination</b>	: Theory Exam.	<b>Minimum Pass Marks</b>	: 20 Marks

*Note: The syllabus is divided into five independent units. The Optical Mark Recognition (OMR) sheet-based question paper will carry total 50 Multiple-Choice Questions (MCQs) by taking 10 questions from each unit. All the questions will be mandatory and each question will have 1 mark.*

#### Course Objectives:

The aim of the course is to provide basic knowledge of the industrial chemistry and processes of preparations of various products which required in day-to-day life. The aim of the course is to fill the gaps between academics and industries regarding theoretical knowledge and practical processes and make the students self-dependent by establishing their own startups/chemical industries.

### Syllabus

#### Unit-1: Pulp and Paper Industries:

**Pulps:** Raw materials, classification, methods of pulping, production of pulps.

**Papers:** Paper properties, processes and techniques: sizing, coating, dyeing, addition of chemicals, calendaring, *etc.*; fibre recovery; basic machinery used in paper manufacturing.

#### Unit-II: Dye and Paint Industries:

**Dyes:** Classification, structures, natural and synthetic dyes, synthesis and applications of azo, phthalein, indigoid, phthalocyanine dyes.

**Paints:** Classification, technologies, properties of coatings, plasticizers and bioactive additives; paint formulations and testings.

#### Unit-III: Glass and Ceramic Industries:

**Glass:** Types, physical and chemical properties, raw materials, glass fibres, formation of batch materials, melting, shaping, annealing and finishing.

**Ceramics:** Classification and general properties, raw materials, formation process, porcelain and china, earthenware and stoneware.

#### Unit-IV: Soap and Detergent Industries:

Introduction, differences between soaps and detergents, theory of detergency, manufacturing of soaps and detergents, emulsions and their characteristics, industrial

applications: smoke precipitation, purification of water, cleaning action of soap, tanning of leather and sewage disposal; environmental impact of drycleaning agents.

#### **Unit-V: Cosmetic and Perfume Industries:**

Introduction of cosmetics and perfumes, theory of action; ingredients of hair dyes, toothpowder, talcum powder, face powder, lipsticks, nail polish, shampoos, creams and lotions; synthetic perfumes, perfume formulation, some representative formulation of rose, jasmine, lavender.

#### **Suggested Books:**

- *Pulp and Paper Industry: Microbiological Issues in Papermaking* by Pratima Bajpai, Elsevier
- *Pulp and Paper Industry: Chemical Recovery* by Pratima Bajpai, Elsevier
- *Environmentally Friendly Production of Pulp and Paper* by Pratima Bajpai, John Wiley and Sons
- *Pulp Bleaching Today*, Hans Ulrich Suess-Walter de Gruyter.
- *Dyes & Paints: A Hands-on Guide to Coloring Fabric* by Elin Noble
- *Handbook on Natural Dyes for Industrial Applications* by Padma S Vankar, National Institute of Industrial Research.
- *The Complete Book on Glass and Ceramics Technology* by NIIR Board of Consultants & Engineers, Asia Pacific Business Press Inc.
- *Raw Materials for Glass and Ceramics: Sources, Processes, and Quality Control* by Christopher W. Sinton, John Wiley & Sons
- *Cement industry* by D. K. Mittal, Anmol Publications
- *Cement Data Book, Volume One: International Process Engineering in the Cement Industry* by Walter H. Duda, French & European Publications
- *Handbook on Soaps, Detergents & Acid Slurry (3rd Revised Edition)* by National Institute of Industrial Research.
- *Soap Manufacturing Technology*, Luis Spitz- Elsevier
- *Soaps and Detergents Vol. 1* by S.C. Bhatia, CBS Publishers & Distributors
- *Herbal Soaps and Detergents Hand Book* by H. Panda, National Institute of Industrial Research
- *The Complete Technology Book on Flavours, Fragrances and Perfumes* by NPCS Board of Consultants & Engineers.
- *Textbook of Cosmetic Formulations*, G. Sharma, J. Gadhiya, M. Dhanawat- Mewar University Publication
- *Industrial Organic Chemistry: K. Weissermel and H.J. Arpe.*
- *Chemical Process Industries: Shreeve.*
- *Industrial Chemistry: B.K. Sharma.*

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